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AUTHOR Cook, Michael P.
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ABSTRACT

One of the important roles of the community psychologist is that of researcher. To determine how well that role is being fulfilled, and to what extent community psychology research conforms to accepted standards of social scientific endeavor, 621 articles published in the American Journal of Community Psychology (AJCP) and the Journal of Community Psychology (JCP) during 1973 to 1980, and 45 articles from an update based on the 1982 AJCP were content analyzed for methodological issues. Results showed that less than 12 percent of the studies were devoted to methodological issues and hardly any were devoted primarily to theory development. Only 30 percent of the studies specifically tested a hypothesis. Methodological weaknesses noted in the literature included the relative lack of control or comparison groups, the use of single occasion measurement designs, small sample size, and nonrepresentative samples. Although the overall quality of community psychology research seems to be improving, the future of the field depends upon the degree to which difficult and complex research methods can be implemented to solve complex social problems. (JAC)

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A METHODOLOGICAL CRITIQUE OF COMMUNITY PSYCHOLOGY:
REFLECTIONS ON RESEARCH IN THE FIELD

Michael P. Cook

Appalachian State University

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A methodological critique of community psychology:
Reflections on research in the field

Michael P. Cook
Appalachian State University

One of the important "500 hats" of the community psychologist is of course the role of researcher. How well are we fulfilling that role and to what extent is community psychology research conforming to accepted standards of social scientific endeavor? This paper is an attempt to address these questions. It is based on a comprehensive content analysis of articles published in the American Journal of Community Psychology (AJCP) and the Journal of Community Psychology (JCP) during the years of 1973 to 1980 with an update based on the 1982 volume of the American Journal of Community Psychology. An analysis of the 1973-1978 volumes of AJCP and JCP have been reported in several other papers in more detail (Lounsbury, Cook, Leader, Rubieiz, & Meares, 1979; Lounsbury, Leader, Meares, & Cook, 1980; Lounsbury, Leader, Meares, & Cook, Note 1). This paper will be concerned primarily with methodological issues in the community psychology research literature.

In addition to the work of Lounsbury and colleagues (Lounsbury et al., 1979, 1980, Note 1), there have been several other efforts to describe the literature in the field of community psychology (Novaco & Monahan, 1980; McClure, Cannon, Allen, Belton, Connor, D'Ascoli, Stone, Sullivan, & McClure, 1980). This affords a rounded picture of the field of community psychology from several points of view. Sometimes, however, I wonder why so many of us spend so much of our time in these highly academic pursuits.

Of course I do feel that there is great value to all of this self analysis. Many of the reasons for analyzing the research in community psychology are discussed in the articles mentioned above (cf. Lounsbury et al., 1980) but I would like to mention several particularly relevant to this paper. First and foremost is the hope that critical analysis of research methods will contribute to the improvement of future research. As you will see from my comments below, there is a great deal of room for improvement in the field. It is quite clear, however, that criticism is not very worthwhile without the display of exemplary cases.

Another reason for being concerned with the content analysis of the research in community psychology is of a documentary nature. Community psychology is a relatively new field of study, possibly somewhat unique in its approach and emphasis, and it is valuable to document the historical development of this field. There have been a number of significant changes in the conduct of research in the field in just the short time that the two journals (AJCP and JCP) have been out. These are changes which we should be aware of.

Method

A content analysis was performed on all articles published from 1973 to 1980 in the AJCP and the JCP. In addition, the 1982 volume of the AJCP was also analyzed to look at trends in the data set. These two journals were chosen as representative of the research conducted in the field of community psychology. Although there are obvious limitations to this strategy, we felt that it was one way of concretely approaching the task of definition of the field.

After developing a standard coding form, analysts were trained to a criterion of at least 80% agreement on every item on the analysis form for ten consecutive articles. Periodic spot checks of one analyst by another were conducted to help ensure reliability over time. A more detailed description of the methods used are given in Lounsbury et al. (1980).

The results presented below are based only on those articles which reported the results of a research investigation. Theoretical, editorial, literature review, and discussion articles were not analyzed. The total number of articles for 1973 to 1980 analyzed below was 621. The number of 1982 AJCP articles was 45.

Results

Purpose Served

Research in community psychology, like research in other fields, is usually done for some broader purpose than simply to inquire into a given topic area. Trickett and Lustman (1977) identified two major purposes of research in community psychology: to promote our understanding of that which is researched and to serve as a basis for social action. This is analogous to the basic versus applied or theory- versus decision-oriented research dichotomies. In the content analysis, it was decided to break these concepts down into 8 categories:

1. Theory development - referring to research which articulated a formal theoretical model and emphasized development of the theory by expressly testing one or more of its propositions. Articles classified as serving the purpose of theory development were usually characterized by extensive discussion of construct relationships and implications for future research on the theory.
2. Program Evaluation - research which was performed to evaluate or assess the worth of a program. Under the generic title of program we included projects, sets of procedures, and other organized sets of activities designed to carry out specified objectives. The emphasis in program evaluation research was typically on assessing program performance against a collection of goals and objectives.
3. Policy analysis and policy research - refers to analysis and research which provides information that is used to formulate, revise, or verify policy (usually social or organizational policy). Following Coleman (1972), we viewed policy analysis/research as serving the

purpose of guiding social action through the implications it draws for policy. In contrast to theory-oriented research, which can deal exclusively with unobservable and inferred variables, policy variables are those which are explicit and subject to direct policy manipulation.

4. Description - refers to studies which serve to describe in a relatively detailed manner the process, structure, or functioning of some type of problem or program, or an aspect of individual or organizational functioning. Such descriptive research may have no direct bearing on theory, programming, or policies.

5. Research and measurement methodology - Some studies are directed not toward a substantive theoretical, programmatic, or policy issue, nor toward describing phenomena, but are conducted for the purpose of advancing the state of the art of research or measurement methods. This might be proposing a new experimental technique, assessing the psychometric qualities of a measurement instrument, or an application of a research method borrowed from another field and put to use in a new and different way.

7. Specific research - This category was devised to include the large number of articles which did not fit into any of the preceding categories. This included articles which examined the relationships among several variables with no reference to theory development, program evaluation, policy analysis, or methodological development.

8. General conceptualization - Finally, there were several articles which discussed a general conceptualization in the field of community psychology. This included personal opinions, criticisms, recommendations, and other types of articles concerning directions and progress in the field.

One or two purposes were checked for each article. The results indicated that 31% of the studies dealt with policy analysis or research; 25% evaluated programs; 25% dealt with specific research topics; 20% served to report detailed descriptions; 12% were directed toward developing the state of the art of research or measurement methodology; 2% advanced a theoretical model or focused on the test of some formal theoretical proposition; and 1% outlined a general conceptualization in the field of community psychology.

Hypothesis Stated

In addition to the above purposes, we also looked at whether or not the study specifically stated a testable hypothesis. Only 30% of the studies did so. In the other studies the purpose seemed to be either exploratory, descriptive, hypothesis generating, or the researcher neglected to specify an implicit hypothesis.

Cronbach Category

In his presidential address at the 1957 convention of the American Psychological Association, Lee J. Cronbach characterized scientific psychology as not one but two independent disciplines, reflecting "two historic streams of method, thought, and affiliation" (p. 671).

Correlational psychology is an approach that concerns itself with the study of naturally existing variation; experimental psychology explores the consequences of creating variation by interventions, or treatments. Although each has contributed valuable knowledge to the field of psychology, Cronbach (1957) argued eloquently for a "true federation" of the disciplines. "Kept independent," he noted, "they can give only wrong answers, or no answers at all regarding certain important problems" (p. 673).

We attempted to define community psychology research in Cronbach's terms by using three categories: experimental, correlational, and experimental-correlational. A study classified as experimental was one in which the main approach was to estimate the magnitude of the effect of a treatment or process, typically an intervention or manipulation administered to a sample of persons. All studies where individual differences were treated as error variance were included in this category. A study classified as correlational was one in which individual differences were measured and considered to be of importance. Finally, those studies which reported a combination of research approaches were classified as experimental-correlational. The results indicated that 57% of the studies were experimental, 20% were correlational, and 23% were experimental-correlational.

Research Strategy

Studies were classified into one of three types of research strategies: field experiments, field studies, and laboratory experiments. A field experiment was defined as an investigation carried out in a "real world" setting where there was some deliberate modification of or intervention into some property of an environment or system. Field studies were construed as the systematic observation of phenomena within natural settings where there was no deliberate modification or intervention on the part of the researcher. Laboratory experiments were systematic observations of phenomena under deliberately controlled conditions in an artificial setting.

We found that 37% of the studies were field experiments, 60% were field studies, and 3% were laboratory experiments.

Design Features

Two important design features which contribute to the internal validity (Cook & Campbell, 1979) of a study are the use of control or comparison groups and the random assignment of subjects to these groups. Using a loose definition of control/comparison group, 58% of the studies analyzed used such a design feature. A control/comparison group was defined as one formed on the basis of either an independent variable such as a type of treatment (or lack thereof) or on the basis of a classification variable such as sex, age, minority group membership, etc. The random assignment of research participants to groups in the study was accomplished in only 9.4% of those studies using control/comparison groups; in only 5.4% of the total number of studies analyzed.

Another important design feature is the "occasion of measurement," i.e., how many times and at what points in the research process are

the dependent variable(s) measured? The most common occasion of measurement used was a post-only design (one occasion of measurement). This was used 67% of the time. The pre/post design where measurement occurred both before and after some treatment or manipulation was used 16% of the time. When more than two occasions of measurement were used, this was designated a time series. Time series was employed about 14% of the time. Finally, the post/post design was used in 1% of the studies. This was where the researcher took followup measures at two points in time.

Statistical Power and Sample Size

Another design feature we looked at was sample size. Sample size has profound impact on the statistical power of a research. Across all studies the median total number of subjects serving in the primary statistical analysis of a study was 85. The median cell size was 32. When broken down into single versus multiple group studies, the median sample size in single group studies was 66 and the median cell size in multiple group studies was 28.

The small sample sizes reported in most of the community psychology literature we examined calls into question their statistical power. By statistical power, we mean the probability of rejecting the null hypothesis when it is false (i.e., the probability of obtaining statistically significant results). Statistical power is crucial for adequately testing any hypothesized relationship, whether the concern is with theoretical models, construct relations, or the ability of a program or service to achieve specified outcomes. At low levels of power, even negative findings or null results are rendered ambiguous.

Although we are interested here in relating statistical power to sample size, it would be helpful to outline several related factors which must also be considered when analyzing statistical power. Drawing on the work of Cohen (1977), statistical power depends upon the effect size or "degree" to which the phenomenon is present in the population" (or "degree to which the null hypothesis is false" - p. 9). The larger the effect size, the greater the power of a statistical test. Statistical power also depends on the criterion of significance set by the investigator (e.g., $\alpha = .05$). Other things being equal, the more stringent the significance criterion (the lower the alpha level), the lower is the statistical power. Statistical power is also a function of the reliability or precision of a sample value, which refers to the degree to which a sample value approximates the relevant population value. The reliability of a statistic can be expressed in terms of its standard error, which in turn is a function of sample size. In general then, the larger the sample size, the greater the power of a statistical test. Finally, in talking about the power of a statistical test and the factors which influence power, one should specify the type of statistical test, as the relationships between power and the other factors will depend on the mathematical function of the statistic considered (Cohen, 1977).

Cohen (1977) has provided a series of tables for estimating the power of statistical tests for varying combinations of sample size, alpha level, and effect size; as well as tables for estimating the sample size required to achieve specified levels of significance at varying

effect sizes and power levels. Table 1 summarizes some selected sample size values based on Cohen's (1977) work. Sample sizes are given for both "small" and "medium" effect sizes, these terms being of course quite arbitrary. The alpha level or statistical criterion level represented in the table is at the .05 level and power levels of .80 and .90 are given.

In comparing the sample sizes indicated in Table 1 with the previously reported median cell size of 28 for studies comparing two or more groups, it can be seen that only in the cases of a product-moment correlation coefficient or a chi-square statistic for a medium effect size, does the typical cell size lend sufficient power to have an 80% chance of rejecting the null hypothesis. You should note that the values summarized here are cell values, not total sample sizes. Thus, one would have to multiply the cell sizes shown in Table 1 by two to estimate the total number of subjects necessary in the case of a t-test of differences between means in a two-group experiment. Similarly, the cell size values for the chi-square and F statistics would require multiplication by 4 to estimate the total number of subjects required of a design comparing four groups.

Sampling Procedure

The procedures used to assure representativeness of study samples are crucial for determining the external validity (Cook & Campbell, 1979) of a research. In 7% of the studies a full census of some population was used (e.g., all of the patients in a particular hospital). The full census presents no problems for external validity assuming that generalizations are not made to other populations. It should be noted that the use of a full census also removes the statistical power problem, again if generalizations are not made to other populations.

In 11% of the studies a representative sample was obtained through the use of such procedures as simple, systematic, or stratified random sampling. In the other 82% of the studies, the obtained sample was determined to be unrepresentative. This was either by design (no representative sampling procedure was attempted), by outcome (we used an arbitrary cutoff of 10% or greater attrition of subjects to classify a sample as nonrepresentative), or by neglect to report procedure (we assumed that no reporting of sampling procedure indicated use of nonrepresentative procedures).

Measurement Procedures

Another methodological feature we examined were the methods used to collect data. We found that 67% of the studies used paper and pencil measures, 22% used archival data sources, 23% used interviews, and 16% used direct observations of behavior. (The total is greater than 100% because a number of studies used more than one method). In 77% of the studies where a self report measure of the paper and pencil or interview type was used, there was no direct observation of behavior performed. Only 11% of the studies used a form of multiple operationism. This is where two or more methods are used to measure the same construct.

Statistical Analysis

Several features of the statistical analysis procedures were examined. Of the studies that we examined, 88% used descriptive statistics such as percentages, means, standard deviations, etc.; and 84% used some type of inferential statistic such as an F or t test, chi square test, etc. In addition, multivariate statistical analyses were reported in 14% of the studies.

Another characteristic of the statistical analysis reported in a study which is of interest is the level of statistical significance reported. We recorded the most lenient level of statistical significance reported (at the two-tailed probability level) in each article. Of the studies which reported the use of inferential statistics, 19% interpreted a result as statistically significant when the probability value was greater than .05 (typically $< .10$), 59% used the conventional alpha level of $< .05$, and 22% used a more stringent alpha level such as $< .01$ or $.001$.

Trends Over Time

Two methods were used to examine changes in community psychology research over time. First, chi square tests were conducted for each of the above variables to detect differences by year for the 1973 to 1980 data. The full trend analysis is reported elsewhere (Lounsbury, Note 1), and only those significant results relevant to the current paper are given below.

Later years in the journals were characterized by a greater emphasis on policy research/analysis and program evaluation and less emphasis on research or measurement methodology. In addition, the use of representative samples increased, as did the use of more stringent levels of statistical significance.

In addition to this trend analysis, the author analyzed a more recent set of articles, 1982 AJCP, to compare to the older articles (1973-1980). Although it was not possible to perform chi square tests, it was felt that this would give an indication of changes in the current research literature. Several changes became apparent from viewing the 1982 articles. Some of the most dramatic changes were the great increase in articles dealing with theory development or testing (3% to 17%), an increase in the use of random assignment to groups (9.4% to 16%) along with an increase in the use of multiple group designs (32% to 51%), increases in the use of representative sampling procedures (18% to 29%) and larger median cell sizes (32 to 116), and greater use of multiple operationism of variables (10.5% to 22%) as well as multivariate statistical analyses (14% to 44%).

Discussion

This critical analysis of community psychology research has brought to light some good and some bad in the body of literature reviewed. It should be kept in mind that we are not criticizing any individual research effort but rather making the point that the incidence of particular methodological features in the body of published research reflects upon the field as a whole.

The largest impetus behind research in community psychology seems to be policy analysis/research and program evaluation. This is not unexpected since these are considered to be major foci of the field. There are also a significant number of studies which are primarily descriptive in nature. This is as it should be because good description is the basis and foundation for any scientific enquiry (Verplanck, 1971). There were less (12%) studies devoted to methodological issues and finally, hardly any studies devoted primarily to theory development. The latter point is also reinforced by the finding that only 30% of the studies specifically tested an hypothesis.

Theory development is critical for the advancement of any science and community psychology has been remiss in this area. There are several reasons for this, one of them being the comparative youth of the field. It is gratifying, however, to note the apparent increase in theoretically-oriented articles in the more recent (1982) literature. I would like to emphasize that reporting a low incidence of theory-driven research is not meant to imply that this is the "best" type of research to do. The point made here is that the amount of theory-driven research in the field as a whole is deficient for the development of community psychology as a social science. Much of the effort of community researchers is directed toward applied problems which may as yet have little if any theoretical base. Hopefully that will grow in the future.

Has community psychology heeded Cronbach's (1957) call for a "true federation" of the two disciplines of psychology? It would seem so from our analysis. Not only is there a mix of approaches represented in the body of research literature analyzed, but there are also a relatively large number of researches which use a mixed approach (23%). There is some concern, however, for the large number of program evaluation and policy-related studies which are almost exclusively "experimental" in approach taken. Studies devoted to these purposes would benefit greatly from correlational as well as experimental approaches. The use of multivariate procedures to analyze process variables is one example of how this is integrated into an evaluative study. Although this does not appear with much frequency in the literature, it seems to be increasing as we look at the 1982 journal articles.

The results of the research strategy question are not surprising. Most of the research reported was conducted out of the laboratory and more of it was intervention-oriented (field experiments) and less was descriptive/observational or nonintervention-oriented. This is certainly consistent with the mandate of community psychology to be

concerned with change in the community. The significant incidence of field experiments may be misleading, however, when consideration is given to questions of internal validity.

One of the methodological weaknesses apparent in the community psychology research literature is the relative lack of control or comparison groups. Only little more than half of the studies in the literature analyzed made use of such a design feature, although this is also apparently on the increase. Further is the issue of comparability of control groups. Only 9.4% of the studies which used control/comparison groups reported a random assignment procedure among the groups. While random assignment of subjects to treatments is not the only means of ensuring internal validity (and may not in and of itself result in high internal validity), it is the most effective means of ruling out alternative hypotheses which might explain obtained results. This justifies the extensive effort needed to include this design feature in more community psychology studies than is currently the practice. A casual observation of the types of comparison groups used in many of the reported studies was that many times, researchers made little or no attempt to obtain comparison groups which were at all comparable. In many cases, comparison groups were no more than the use of classification variables such as sex, race, etc.

Another important design feature is the occasion of measurement. The most common occurrence was a post-only design (67%). This is of course particularly problematic when there has been no random assignment of persons to treatments. Many of the so-called quasi-experimental designs require both pre and post measures and this was accomplished only 31% of the time. Fortunately, there are indications from the 1982 analysis that the use of single occasion of measurement designs is on the decline and that more complex designs such as time series designs are on the increase.

The problem of low statistical power due to small sample size may be one of the most critical in the research literature analyzed. From the results it is apparent that few studies have reached a reasonable level of statistical power in order to detect real effects because of the small sample sizes used. Recent articles by Frank Schmidt, John Hunter, and others (Schmidt, Hunter, & Urry, 1976; Schmidt & Hunter, 1978; Schmidt, Hunter, & Pearlman, 1980) have called into question many years of accumulated research in the personnel psychology area because of research artifacts which act to reduce statistical power. The trend toward the use of larger sample sizes (which seems to be fairly significant) augers well for the future of the field as a science as well as in the policy arena because we become more able to detect effects which have impact on peoples' lives.

In addition to small sample size, there are two other factors which were not content analyzed but will likely compound the power problem: range restriction and attenuation of the variables analyzed. Range restriction is the selection of subjects or the choice of a measurement device which results in the reduction of the variability of the scores. Attenuation is any reduction of the accuracy of measurement caused by random errors of measurement, i.e., unreliability. Both of these factors can act to reduce the power of

any statistical test. For example, Schmidt, Hunter, & Urry (1976) present tables for the statistical power of validity coefficients which show that a sample size of 959 would be necessary to detect a true correlation of .35 with .90 confidence if the reliability for one measure were .50 and if the top 10% of the scores in the population distribution for the other measure had been selected for estimating the correlation coefficient. It should be noted that an informal review of the 1973-1980 data base revealed very few articles which reported reliabilities or other psychometric properties of the measurement devices used. There seems to be a trend however, as evidenced in the 1982 review, that researchers are becoming more responsible in this area.

In considering external validity, the representativeness of study samples is crucial. This is another critical problem with the research analyzed here. A total of 82% of the studies in the literature had unrepresentative samples of research participants. (I will admit at this point, however, that the arbitrary cutoff used to define a sample as unrepresentative was fairly stringent for those studies with attrition). This is particularly problematic in a field such as community psychology because the focus of many studies is policy analysis and program evaluation. The promulgation of programs validated on unrepresentative samples can be costly in both monetary and human terms. Again, the apparent trend toward the greater use of representative sampling procedures is a positive note.

The effort in obtaining truly representative samples of adequate size to ensure statistical power of appropriate levels, and of implementing random assignment procedures are formidable in an applied field setting as we all know. Another critical area of the research analyzed also requires effort on the part of the researcher. Only 11% of the studies used more than one measurement procedure (multiple operationism) to assess the important variables in the study. When this is coupled with the observation that only a very few studies reported on the psychometric qualities of their measures, we have another potential problem.

The use of extremely liberal alpha levels as reported earlier may be a function of the large number of exploratory studies and lax standards characterizing the early years of research in community psychology. It is certainly laudable that this has changed over the several years of this content analysis.

The use of multivariate statistical procedures can be very helpful in laying open the extremely complex processes that are studied in community research. The continued rise in the use of these methods will go a long way toward furthering the field.

As with all social science research, there are numerous caveats to this enquiry. First of all, the use of more stringent experimental methods such as random assignment of subjects, representativeness of samples, use of control groups, multiple operationism, and multiple occasions of measurement, are not the "best" methods at all times in every research. It may be that the "true" experiment gives us the most unequivocal evidence of causal relations between variables, but other means of designing research have their place in the process of

social problem solution (cf. Fairweather & Tornatzky, 1977).

The above critical discussion is not meant to imply that fine community psychology research is not conducted. There are many examples of such research. Unfortunately, they are the exceptions. The body of community psychology research taken as a whole is lacking in methodological rigor. To some extent, this is due to the youth of the the field. As we look at the history of community psychology research, we see the research gaining in maturity through the methods used. The lack of methodological rigor also is due in large part to the complex issues involved in conducting research in applied community settings (Lounsbury et al., Note 1). The future of the field depends upon the degree to which we can implement difficult and complex research methods in order to solve complex social problems.

When I first began looking at the research in the field of community psychology as a graduate student several years ago, I was dismayed and disappointed with the quality of that research. As I look back now over ten years of published research in the field, I can conclude that overall, it has changed for the better.

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Table 1

Estimated Cell Sizes Required to Detect "Small" and "Medium" Effect Sizes for Different Statistical Tests at Two Levels of Statistical Power

Effective Size	Power	Significance Criterion	Statistical Test			
			t	r	F	
"Small"	.80	.05	393	193	196	388
	.90	.05	526	258	263	463
"Medium"	.80	.05	64	28	22	63
	.90	.05	85	37	29	78

Note. The source for these estimates is Cohen (1977).